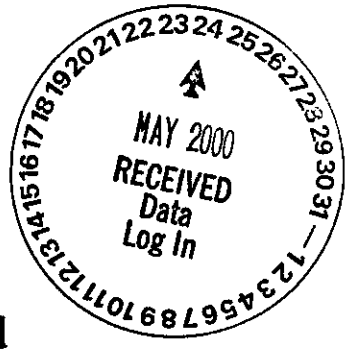
W03164

Quanterra

0053534

Bechtel Hanford



Analysis By

Severn Trent Laboratories Richland

2800 G.W. Way, Richland, Wa 99352, (509) 375-3131

Report Nbr: 10521

SDG No.	SAF No.	CLIENT ID No.	STL ID No.
W03164	B99-005	B0Y2P0	9DCM8N10
		B0Y2P1	9DCM8Q10

EDMC

Comments:

0001

Quanterra

Quanterra
2800 George Washington Way
Richland, Washington 99352-1613

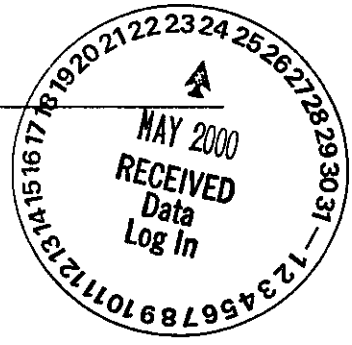
509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

May 22, 2000

Attention: Joan Kessner



SAF Number	:	B99-005
Date SDG Closed	:	May 2, 2000
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W03164
Data Deliverable	:	15 Day / Summary

I. Introduction

On May 2, 2000, two soil samples were received at STL Richland (STLR) for chemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

STLR ID#	BHI ID#	MATRIX	DATE OF RECEIPT
9DCM8N10	B0Y2P0	SOIL	5/2/00
9DCM8Q10	B0Y2P1	SOIL	5/2/00

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was: **Chemical Analyses**
Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W03164 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in mg/L.

IV. Comments

Chemical Analyses

Chromium Hex by EPA method 7196:

The matrix spike recovery was below acceptance limits. The batch was reanalyzed. The reanalysis results for the LCS, batch blank, sample, sample duplicate (B0Y2P0) and sample matrix spike (B0Y2P0) are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Jackie Waddell
Project Manager

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SAMPLE RESULTS

LAB NAME:	**STL Richland**		**SDG: /RPT GRP:**	W03164 / 10521	
LOT,RPT DB ID:	-	9DCM8N10	**MATRIX:**	SOIL	
CLIENT ID:	B0Y2P0		**DATE RECEIVED:**	5/2/2000 11:05:00 AM	

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	RPT UNIT	YIELD	METHOD NUMBER	WORK ORDE	BAT-CH
HEXCHROME	8.00E-02	U	N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196		

Number of Results: 1

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SAMPLE RESULTS

LAB NAME:	**STL Richland**		**SDG: /RPT GRP:**	W03164 / 10521
LOT,RPT DB ID:	-	9DCM8Q10	**MATRIX:**	SOIL
CLIENT ID:	B0Y2P1		**DATE RECEIVED:**	5/2/2000 11:05:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	RPT UNIT	YIELD	METHOD NUMBER	WORK ORDE	BAT-CH
HEXCHROME	2.20E-01		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196		

Number of Results: 1

Result = IDL When Not Detected

(Q)ualifiers: ***U = Analyte result < MDA/IDL,***
J = No U qualifier and result <

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DUPLICATE RESULTS

LAB NAME:	**STL Richland**		**SDG: /RPT GRP:**	W03164 / 10521
LOT,RPT DB ID:	-	DCM8N17R	**MATRIX:**	SOIL
CLIENT ID:	B0Y2P0		**DATE RECEIVED:**	5/2/2000 11:05:00 A
ORIG LAB ID:	9DCM8N10			

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
HEXCHROME	8.00E-02	U	N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196	8.00E-02	0.00%

Number of Results: 1

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

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BLANK RESULTS

LAB NAME: STL Richland **SDG /RPT GRP:** W03164 / 10521

LOT,RPT DB ID: - DCR5N11B **MATRIX:** SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	RPT UNIT	YIELD	METHOD NUMBER	WORK ORDE	BAT-CH
HEXCHROME	1.00E-03	U	N/A	N/A	2.00E-03	mg/L	N/A	EPA7196		

Number of Results: 1

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LABORATORY CONTROL SAMPLE

LAB NAME:	**STL Richland**	**SDG: /RPT GRP:**	W03164 / 10521
LAB SAMPLE ID:	DCR5N12S	**MATRIX:**	SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
HEXCHROME	9.41E-01		N/A	N/A	2.00E-03	mg/L	N/A	1.00E+00	94.10%

Number of Results: 1

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

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MATRIX SPIKE RESULTS

LAB NAME:	**STL Richland**	**SDG: /RPT GRP:**	W03164 / 10521
LAB SAMPLE ID:	DCM8N16W	**MATRIX:**	SOIL

ANALYTE	SPIKE RESULT*	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	SAMPLE RESULT	EXPECTED	RECOVERY
HEXCHROME	3.33E+01		N/A	N/A	8.00E-02	mg/kg	8.00E-02	3.99E+01	83.51%

Number of Results: 1

*Spike Result Corrected For Sample Result

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

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MATRIX SPIKE RESULTS

LAB NAME:	**STL Richland**	**SDG: /RPT GRP:**	W03164 / 10521
LAB SAMPLE ID:	DCM8N18W	**MATRIX:**	SOIL

ANALYTE	SPIKE RESULT*	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	SAMPLE RESULT	EXPECTED	RECOVERY
HEXCHROME	6.41E+02		N/A	N/A	8.00E-02	mg/kg	8.00E-02	6.74E+02	95.07%

Number of Results: 1

*Spike Result Corrected For Sample Result

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

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Richland Laboratory
Data Review Check List
METALS

Work Order Number(s): DCM8N, DCM8Q, BATCH# 0125415 LOT# JDE020165-001

Lab Sample Numbers or SDG: W03164

Method/Test/Parameter: Cr+6 IN SOIL

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration				
1. Performed at required frequency wih required number of levels?	✓			✓
2. Correlation coefficient within QC limits?	✓			✓
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	✓			✓
4. Initial calibration blank(ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			✓
B. Continuing Calibration				
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			✓
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			✓
C. Sample Analysis				
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?	✓			✓
2. Were all sample holding times met?	✓			✓
D. QC Samples				
1. All results for the preparation blank below limits?	✓			✓
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?	✓			✓
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?	✓			✓
4. Analytical spikes within QC limits where applicable?			✓	✓
5. ICP only: One serial dilution performed per SDG?			✓	✓
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			✓	✓
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			✓	✓

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
E. Other				
1. Are all nonconformances included and noted?			✓	✓
2. Is the correct date and time of analysis shown?	✓			✓
3. Did the analyst sign and date the front page of the analytical run?	✓			✓
4. Correct methodology used?	✓			✓
5. Transcriptions checked?	✓			✓
6. Calculations checked at minimum frequency?	✓			✓
7. Units checked?	✓			✓

Comments on any "No" response:

Analyst: M. Fabri Date: 5/9/00

Second-Level Review: Roxie Ross Date: 5/9/00

Form No. CG-191, Rev. 2, 1/97

CHAIN OF CUSTODY

Q-27038

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-005-109	Page 1 of 1

Collector: Cowgill/Kerkow	Company Contact: RB Kerkow — Telephone No.: 531-0635	Project Coordinator: TRENT, SJ	Price Code: 8K — Data Turnaround: 15 Days
Project Designation: 100 D Areas - Full Protocol	Sampling Location: 100D / 100-D-12	SAF No.: B99-005	Air Quality ☐
Ice Chest No.: ERC-99-010	Field Logbook No.: EL-1339-6 — COA: R00D122600	Method of Shipment: ~~FedEx~~ RA 5-2-00 Hand Delivered	
Shipped To: Quanterra Incorporated	Offsite Property No.: NA	Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially Radioactive

Special Handling and/or Storage

SDA — Due 5-17

SAMPLE ANALYSIS

W03164 — JOE020165

Preservation	None	Cool 4C											
Type of Container	P	aG											
No. of Container(s)	1	1											
Volume	20mL	60mL											
	Activity Scan	Chromium Hex - 7196							TIE TO				

Sample No.	Matrix *	Sample Date	Sample Time										
B0Y2P0 DCMBN	Soil	5/1/00	1018	X	X					BOWYA			A2-3
B0Y2P1 DCMBQ	Soil	5/1/00	1106	X	X					↓			A4-12

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By / Date/Time	Received By / Date/Time
JA Cowgill/Aaron Cowgill 5-1-00/1615	Fridge 115 5-1-00/1615
RA 1000	
RA 1B 5-2-00 1000	R. Kelly/R.E. Hilley 5-2-00 1000
R. Kelly/R.E. Hilley 5-2-00 1105	PNW 5-2-00 1105
	2100CPM

SPECIAL INSTRUCTIONS
Lab COA: R00D12 2F00

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

ERC Radiological Counting Facility Analysis Report

CF Number RCF6780

Sample Date & Time 11/9/99 1310

Project ID: 100DR SAF Number: B99-004

Date Analyzed 11/10/99 7:07:

Sample ID: B0WY19

Gamma Energy Analysis

Nuclide		Activity (pCi/g)		Error (pCi/g)	MDC (pCi/g)
K-40		1.8E+01	+/-	1.9E+00	7.4E-01
Co-60	<	7.7E-02			7.7E-02
Cs-137	<	5.0E-02			5.0E-02
Eu-152	<	1.4E-01			1.4E-01
Eu-154	<	3.0E-01			3.0E-01
Eu-155	<	2.8E-01			2.8E-01
Am-241	<	1.5E-01			1.5E-01

Tie To:
B0Y2P0
B0Y2P1

Total GEA (pCi/g)	1.8E+01	+/-	1.9E+00

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	N/R	+/-	N/R
Gross Beta	N/R	+/-	N/R

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDA = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDA GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

nalyst T. J. Snider 11/11/99

Report To	Fax
Duane Jacques	373-1395
Dave St John	372-9487
RB KERKOW	373-1395

Report Printed: Thursday, November 11, 1999

Date/Time Received: 5-2-00 1105 SDG#: W031164

Work Order Number: JOE020165 SAF#: B99-005

Shipping Container ID: ERC 99 010 Chain of Custody #: B99-005-109

1. Outermost shipping container damaged? Yes [ ] No [✓]

2. Custody Seals on shipping container intact? Yes [✓] No [ ]

3. Custody Seals dated and signed? Yes [✓] No [ ]

4. Chain-of-Custody record present? Yes [✓] No [ ]

5. Chain-of-Custody includes the following information:
   - Client name Yes [✓] No [ ]
   - Project name or number Yes [✓] No [ ]
   - Sample date/time for each sample Yes [✓] No [ ]
   - Container types, sizes and number of containers Yes [✓] No [ ]
   - Short description of sample, i.e., matrix Yes [✓] No [ ]
   - Analyses requested Yes [✓] No [ ]
   - Preservation used or "none" or N/A if not applicable Yes [✓] No [ ]
   - Date and time of relinquish and receipt Yes [✓] No [ ]
   - Signatures of those persons relinquishing and receiving Yes [✓] No [ ]

6. Sample numbers on chain of custody match those on sample containers? (4) Yes [✓] No [ ]

7. Collection date and date of laboratory receipt are within project specific holding time requirements? Yes [✓] No [ ]

8. Cooler temperature: 4°

9. Vermiculite/packing materials is: Wet [✓] Dry [ ]

10. Samples have: ✓ tape ✓ hazard labels ✓ custody seals ✓ appropriate sample labels

11. Samples are: ✓ in good condition ___ leaking ___ broken ___ have air bubbles

12. Were any anomalies identified in sample receipt? Yes [ ] No [ ]

13. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: BWL Date: 5-02-00

Telephone/Fax/E:mailed to: _____ On _____ By _____

Client Sample Screening Results

02-May-00

R 5/2/00

CLIENT CODE	ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B
BHI	B0Y2P0DCM8N		5/2/2000 2:17:00 PM	QUAD21B	5/2/2000 3:23:31 PM	B0Y2P0DCM8N	30	9	0.215	95	2.19666667
	DCM8N	SOIL		Bkg:	5/2/2000 2:08:12 AM	BKG	600	51	0.085	582	0.97
Anl Date:	5/2/00	Tot Sa, Alq:	1.00E+02	, 1.03E+02	Alp; (Dpm/	1.39E+00	(uCi/	6.08E-04	(pCi/	6.08E+00	± 5.2E+00 CAT I 8.2E+00 Lab Alq
Ppt mg:	103.3	Units:	g	, mg	Bet; Alq):	4.84E+00	Sa):	2.11E-03	L/g):	2.11E+01	± 3.2E+00 4.7E+00 L/g
BHI	B0Y2P1DCM8Q		5/2/2000 2:17:00 PM	QUAD21C	5/2/2000 3:23:31 PM	B0Y2P1DCM8Q	30	9	0.221666667	101	2.46166667
	DCM8Q	SOIL		Bkg:	5/2/2000 2:08:12 AM	BKG	600	47	0.078333333	543	0.905
Anl Date:	5/2/00	Tot Sa, Alq:	1.00E+02	, 1.11E+02	Alp; (Dpm/	1.44E+00	(uCi/	5.86E-04	(pCi/	5.86E+00	± 4.8E+00 CAT I 8.5E+00 Lab Alq
Ppt mg:	110.6	Units:	g	, mg	Bet; Alq):	5.43E+00	Sa):	2.21E-03	L/g):	2.21E+01	± 3.1E+00 4.5E+00 L/g

RQC050 Severn Trent Laboratories, Inc. Run Date: 5/04/00
WET CHEM BATCHSHEET Time: 17:50:52

PRODUCTION FIGURES - WET CHEM

TOTAL NUMBER	SAMPLE NUMBER	QC	RE-RUN MATRIX	RE-RUN OTHER	MISC NUMBER	TOTAL HOURS	EXPANDED DELIVERABLE

METHOD: EA Chromium, Hexavalent (7196A)
QC BATCH #: **0125415** INITIALS: DATA ENTRY:
PREP DATE: 5/04/00 PREP _____ INITIALS _____
USER: ROSSR ANAL _____ DATE _____

Work Order	Lab Number	Structured Analysis	Exp. Del.	Analysis Date	Sample ID:	Control Limits
DCM8N-2-01	J-0E020165-001	XX A DW EA 5I			B0Y2P0	
DCM8N-1-06	J-0E020165-001-S	XX A DW EA 5I			B0Y2P0	(75-125)
DCM8N-1-08	J-0E020165-001-S	XX A DW EA 5I			B0Y2P0	(75-125)
DCM8N-1-07	J-0E020165-001-X	XX A DW EA 5I			B0Y2P0 DUP	
DCM8Q-2-01	J-0E020165-002	XX A DW EA 5I			B0Y2P1	
DCR5N-1-01	J-0E040000-415-B	XX A DW EA 5I			INTRA-LAB BLANK	
DCR5N-1-02	J-0E040000-415-C	XX A DW EA 5I			INTRA-LAB CHECK	(80-120)

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COC Signature Page

Lot or Batch #:	Initials/Date	Procedure #
Released By		
Received	M. J 5/2/00	RICHWC 5005 R.4
Released By	M. J 5/9/00	n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		

RC-131, Rev.1, 6/99